STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Earl Ray Tomblin
Governor

Michael J. Lewis, M.D., Ph.D.
Cabinet Secretary

August 26, 2011

Ex. 4 - CBI
WVAWC- Huntington Dist
4002 Ohio River Road
Huntington, WV 25702

Re: Sanitary Survey
WVAWC - Huntington Dist
PWSID No. WV3300608
CABELL COUNTY

Dear **Ex. 4 - CBI**:

On August 10, 2011 a Sanitary Survey was conducted of the referenced water system by a representative of the Saint Albans District Office of the Office of Environmental Health Services (OEHS). This was performed in accordance with the requirements of the *West Virginia Public Water System Legislative Rules.* We would like to thank you and the site visit participants for the courtesy and assistance provided during the inspection of your public water supply system.

Eight major elements were reviewed in detail during this sanitary survey. The eight major elements are: source, treatment, distribution system, finished water storage, pumps/pump facilities and controls, monitoring/reporting/data verification, water system management/operation, and operator compliance with State requirements. Deficiencies found or recommendations made concerning these eight major elements are presented in the following sections.

Based upon review of the available records and visual examination of the facilities, **no significant deficiencies require your immediate attention**; however, some minor deficiencies and recommendation exist and are documented within this letter. Your system should be commended on all achieving a level of no significant deficiencies.

BUREAU FOR PUBLIC HEALTH
OFFICE OF ENVIRONMENTAL HEALTH SERVICES
Saint Albans District Office
808 B Street, Suite G
Saint Albans, West Virginia 25177
Telephone: (304) 722-0611 FAX: (304) 722-0615

Significant Deficiencies

A significant deficiency is defined as: *"Any defect in a system's design components, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the department determines may cause an unacceptable public health risk; have the potential to cause the introduction of contamination into drinking water; or may adversely affect the reliable delivery of safe drinking water to the public."*

No observations were recorded in this category.

Minor Deficiencies

The following observations made at the time of the survey don't fully meet the definition listed previously for significant deficiencies at the present time but have the potential to result in significant deficiencies in the near future if not addressed. WVDHHR strongly requests that the following minor deficiencies be addressed to help maintain compliance with primary drinking water regulations.

FACILITY	CATEGORY	DESCRIPTION
LAVALETTE TANK	Finished Water Storage	Inadequate overflow erosion control measures provided.
Comments: One of the main support footings has significant erosion due to overflowing of the tank. This support is directly below the overflow line. This areas should be backfilled and a proper splash guard and runoff control should be installed.		
FACILITY	CATEGORY	DESCRIPTION
LAVALETTE TANK	Finished Water Storage	Storage tank needs painting.
Comments: The support legs and main water line have numerous large rust areas. These areas should be cleaned and painted.		

Recommendations

The following observations made at the time of the survey have the potential to produce or to result in minor or significant deficiencies in the near future. WVDHHR recommends that the following be addressed to help maintain compliance with primary drinking water regulations.

FACILITY	CATEGORY	DESCRIPTION
WVAWC HUNTINGTON DISTRIBUTION SYSTEM	Distribution System	Other item found not covered under available observations.
Comments: The Lavalette master meter vault should be locked when unattended. The Rt. 10 meter vault was carrying a few inches of water. This vault is designed to have a gravel bottom for proper drainage. This should be checked and corrected as needed to prevent water accumulation.		
FACILITY	CATEGORY	DESCRIPTION
WVAWC HUNTINGTON DISTRIBUTION SYSTEM	Distribution System	System does not have an active cross connection control program. *CSR 64-15-8.2*.
Comments: The system had started its cross connection and backflow prevention program. The program is off to a good start. A continued effort will be needed to fully implement this program and maintain it in the future.		
FACILITY	CATEGORY	DESCRIPTION
EDGEWOOD BOOSTER STATION	Pump/pumping facility and control	Other item found not covered under available observations.
Comments: The roof of the booster station was recently damaged by a third party. This should be repaired before water damage occurs within the building.		
FACILITY	CATEGORY	DESCRIPTION
LAVALETTE TANK	Finished Water Storage	Other item found not covered under available observations.
Comments: The barbed wire across the top of the fence is broken in several locations. This should be repaired		

Reminders

The following are general reminders that all WV public water systems need to keep in mind for continued compliance in various areas.

- West Virginia and federal rules require the records of all laboratory tests, chlorine residuals, and copies of written communication relating to inspections be kept on file for a period of **ten (10)** years.

- According to West Virginia rules, all plans for the future use of a source of supply, treatment, construction of new wells, water treatment plants, pumping stations, finished water storage facilities and distribution facilities including line

extensions greater than 1000 feet used in connection with the public water supply system must be approved by DHHR in our Charleston office prior to construction. A permit application must be submitted and approved by DHHR/OEHS for any such improvements.

- West Virginia rules require that you immediately notify the appropriate OEHS offices and responsible local officials when a major breakdown or serious loss of water service occurs which presents or may present an imminent and substantial endangerment to human health.

- **Operator training hours are required during every two-year renewal period for water and wastewater operators.** Failure to attain the required continuing education hours (CEH) will result in non-renewal of an operator's certificates. Please contact the Training and Certification Unit office at 304-356-4335 or my office if you need a list of training classes and dates.

Since no "significant deficiencies" were found during this survey you do not need to submit a written response to the items listed; however, the items listed as "minor" or as "recommendations" could eventually lead to more serious conditions so the system should try to address them.

Should you have any comments or questions concerning this report and its contents please contact me by telephone at 304-722-0611 or by email at Richard.C.Snyder@wv.gov.

Sincerely,

Richard Snyder, P.E., District Engineer
St. Albans District Office
Environmental Engineering Division

RCS

Enclosure

pc: Ex. 4 - CBI

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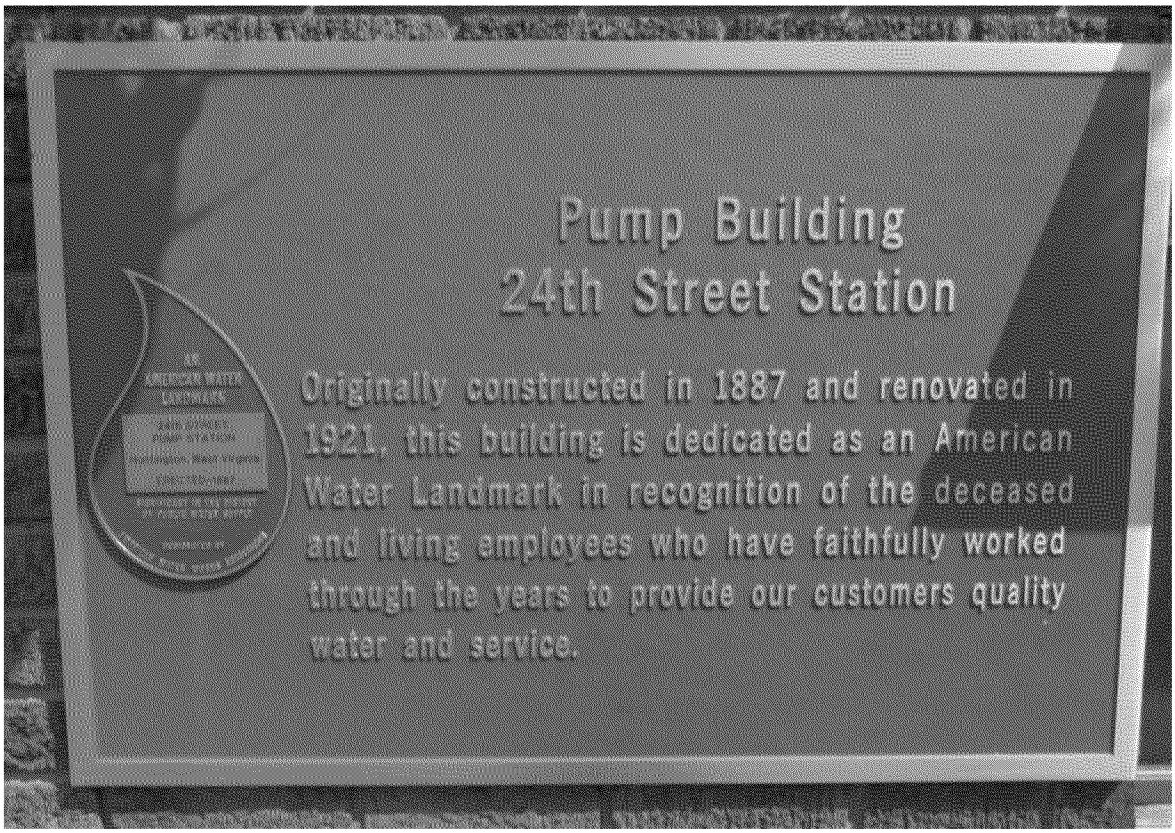
SANITARY SURVEY

PWSID No. WV3300608
WVAWC-HUNTINGTON DISTRICT
CLASS 4 SURFACE WATER TREATMENT PLANT AND DISTRIBUTION SYSTEM
CABELL COUNTY



BY: Richard Snyder, P.E., DISTRICT ENGINEER

OFFICE OF ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL ENGINEERING DIVISION
WV BUREAU FOR PUBLIC HEALTH
SAINT ALBANS DISTRICT OFFICE

August 10, 2011

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WVAWC-HUNTINGTON DISTRICT
PWSID No. WV3300608 –CABELL COUNTY
CLASS 4 SURFACE WATER TREATMENT PLANT AND DISTRIBUTION SYSTEM

Sanitary Survey — August 10, 2011

REPORT SUMMARY

The treatment plant for the West Virginia-American Water Company - Huntington District water system is located in Huntington, West Virginia. Salt Rock PSD, PWSID No. 3300611, was consolidated with the Huntington District in April of 2006. The system serves portions of Cabell, Wayne and Lincoln Counties. There are no outstanding violations against the system and the system is producing water in compliance with the current regulations pursuant to the *West Virginia Public Water Systems Legislative Rules*.

Raw water is supplied from the Ohio River adjacent to the treatment facility on 24th Street and from a secondary intake near 40th Street. The plant currently treats approximately eleven million seven hundred thousand (11,700,000) gallons per day while operating twenty-four (24) hours per day. The plant supplies water through a distribution system of nearly seven hundred twenty seven (727) miles of piping and 59 booster stations to a total population of approximately one hundred thirty seven thousand (137,000); including the purchase systems of Lavalette PSD and Ohio-American Water Company. Finished water storage capacity in the system is eleven million four hundred seventy two thousand (11,472,000) gallons in twenty (20) storage structures.

Eight major elements were reviewed in detail during the survey and discussed as separate sections within this Sanitary Survey. The eight major elements are: source, treatment, distribution system, finished water storage, pumps/pump facilities and controls, monitoring/reporting/data verification, water system management/operation, and operator compliance with State requirements.

All required system monitoring and reporting are current and in compliance. There are adequate personnel to manage and operate the system and the operators currently on staff are in compliance with State requirements.

No significant deficiencies were noted during this Sanitary Survey.

SOURCE

WATERSHED MANAGEMENT PROGRAM
(SURFACE WATER SOURCE ONLY)

Watershed Description (examples: tributaries, counties/areas) *The system draws raw water from the Ohio River. The Ohio River drains a vast area which includes parts of New York, Pennsylvania, Ohio and West Virginia. Major tributaries in the immediate area include the Guyandotte River, Kanawha River, Little Kanawha River, Middle Island Creek and Muskegum River. These tributaries are fed by numerous named and unnamed smaller tributaries.*

Watershed Characteristics (examples: soil types, activities) *The drainage area covers a vast area with various soil types and activities. The dominant soil type in the immediate vicinity of the intakes is a sandy silt along the alluvial plain of the river. The soils are underlain primarily with sandstone, shale, and coal. Land uses within the watershed include urban, industrial, agricultural and wooded areas. Major activities include steel manufacturing, oil refineries, chemical plants, coal mining, timbering, agriculture, river barge traffic, and transportation industries. There are numerous wastewater treatment facilities upstream of the systems raw water intakes.*

Number of Intakes *2*

Intake Name *24th Street Intake (primary)*

Intake Name *40th Street Intake (secondary)*

	Yes		No	
Does the system own the entire watershed?				√
If the system does not own the entire watershed, does it own the critical areas?		√		
Does the system have any Landowner Agreements for watershed protection?				√
Are any regulatory agency permits issued in the drainage (mining, logging)?		√		
Does the system complete an Annual Watershed Management Report?				√

SOURCE VULNERABILITY ASSESSMENT
Sensitivity of the source water protection area (SWAP)
(SURFACE WATER SOURCE ONLY)

	Yes		No	
Is the intake located near shore or in a turbid water area?				√

SOURCE

Are the slopes in the immediate drainage areas steep?	**Yes**		**No**	√
Is the land in the immediate areas non-vegetated?	**Yes**		**No**	√
Are large paved or non-permeable areas present in the immediate area?	**Yes**		**No**	√
Does the intake have the ability to draw from multiple levels? *24th street no (19 ft. cover typical); 40th street yes 1 @ 9f.t and 1@19 f.t cover*	**Yes**		**No**	√
Does the system have the ability to backflush or clean the intakes?	**Yes**	√	**No**	
Is the intake screened? *Intakes are equipped with Johnson screens.*	**Yes**	√	**No**	
Is the area around the intake restricted?	**Yes**		**No**	√
Are there known sources of pollution near or at the intake?	**Yes**		**No**	√
Does the system have an emergency spill response plan?	**Yes**	√	**No**	

Raw water pump elevations *Motors located above flood plane* *497 ft.* **100-year flood elevation** *553 ft.*

SOURCE WATER QUALITY
(ALL SOURCE WATER TYPES)

Does the system regularly monitor raw water? *Minimum 1/day – utilizing in-house laboratory for Turbidity, Fluoride, Alkalinity, pH, Hardness, Iron, Dissolved and Total Manganese.*	**Yes**	√	**No**	

List known causes of raw quality fluctuations *Upstream weather events and spills.*

Does system source generally supply adequate quantity to meet demand?	**Yes**	√	**No**	
Does the system regularly have seasonal shortages of raw water?	**Yes**		**No**	√
Has the system ever had a shortage of raw water?	**Yes**		**No**	√
Has the system ever instituted a conservation plan?	**Yes**		**No**	√
Does the system have a master meter to measure quantity of water treated?	**Yes**	√	**No**	
Is the source used the best possible available source?	**Yes**	√	**No**	

TREATMENT

Treatment Facility Name *West Virginia American Water Huntington District-24th Street Plant*

Is the treatment facility out of the 100-year flood plain elevation? *Flood wall, elevation 560 ft., runs through plant. The 100 year flood elevation is 553 ft.*

Yes		No	√

See ATTACHMENT S *A* **for schematic/layout map of the treatment facility.**

Does the system have a backup source of power?

Yes	√	No	

Electricity to the plant is provided through two separate power grids which serve as an adequate backup system. The system has a portable generator that can be utilized at an individual booster station as needed.

If the system has a generator, how often is it tested? *N/A*

Design Capacity of the treatment facility *20 MGD*

Historic maximum daily production *23.6 MGD (1977)*

Does the system have duality (Can system meet demand with a unit out)?

Yes	√	No	

Does the system regularly check the actual capacity versus design capacity?

Yes	√	No	

Average Production Data

	Year		
	2009	**2010**	**2011***
Daily Water Treated (MGD)	11074	11597	11756
Daily Pumping Time (hours)	24	24	24

* Jan - June 2011

Specify the treatment process/objective which best describes the facility:
(See pages 3-38, 3-39, and 3-40 of the EPA Guidance Manual for description of each)

Conventional Filtration	√	**Direct Filtration**		**In-Line Filtration**	
Slow Sand Filtration		**Single Stage Softening**		**Two Stage Softening**	
Conventional Filtration/Softening		**Split and Complex Treatment**		**Membrane Filtration**	
Greensand Filtration		**Simple Aeration Plant**		**Disinfection Treatment**	

TREATMENT

PRESEDIMENTATION

Number of Presedimentation units *0*

Total Volume of Presedimentation units *N/A*

How often are the Presedimentation units cleaned? *N/A*

Are the Presedimentation unit volumes adequate to adequately reduce turbidity?	**Yes**	*N/A*	**No**	
Does the system have waterfowl problems on the Presedimentation units? *N/A*	**Yes**		**No**	

RAPID MIX

Number of Rapid Mix units *2*

Type of Rapid Mix units

	In-Line Static Mixer	√	**Mechanical** *New VFD installed*		**Other (list type)**

Total Volume of Rapid Mix units *28,000 gal.*

How often is maintenance performed on Rapid Mix units? *Preventative: 6 months; Major: As needed*

Do the Rapid Mix units appear visually adequate?	**Yes**	√	**No**	
Is the mixing rate adjustable in the Rapid Mix units?	**Yes**	√	**No**	
Are coagulants added continuously to or before the Rapid Mix units?	**Yes**	√	**No**	
Are any hydraulic inadequacies present at the Rapid Mix?	**Yes**		**No**	√
Are any cross-connections present at the Rapid Mix (Ex: submerged feed lines)?	**Yes**		**No**	√

TREATMENT

CHEMICALS AND CHEMICAL FEED SYSTEMS

List the chemicals currently being used/applied

Name of Chemical	Point of Application	ANSI/NSF Std. 60 Approved	
		YES	NO
Ferric Chloride Polymer (AS 2820)	*Rapid Mix & Sed. Basin effluent*	√	
Chlorine (gas)	*Sedimentation basin effluent & Clearwell*	√	
Sulfuric Acid-H_2SO_4	*Rapid Mix –used when needed for pH adjustment*	√	
Powdered Activated Carbon (PAC)	*Rapid Mix – used when needed*	√	
Hydrofluosilicic Acid (23%)-H_2SiF_6	*Clearwell*	√	
Caustic Soda-NaOH 25% or 50% based on ambient temperature	*Sedimentation basin effluent & Clearwell*	√	
Zinc Orthophosphate	*Clearwell - Mid*	√	
Potassium Permanganate -$KMnO_4$	*Intake used when needed (not used in previous three years)*	√	

Are the chemicals used appropriate for treatment desired/required? Yes √ No

List the chemical feed systems being used*

Chemical	Feeder Type/Model	Size	Max. Pressure	Current Settings

**See attachments B, Treatment Plant Data and Chemical Feed Settings.*

List the average chemical dosage rates for year indicated

	AS 2820 Polymer mg/l	H2SO4 mg/l	NaOH mg/l	NFS mg/l	Zinc Phosphate mg/l	Filter Aid mg/l	Pre Chlorine mg/l	Post Chlorine mg/l
2009 Average	28.7	5.3	16.7	4.2	2.8	0.2	2.1	2.9
2010 Average	24.8	4.2	13.9	4.0	2.6	0.4	2.6	3.3
2011 Average*	23.2	1.0	25.8	4.6	2.6	0.6	2.6	3.5
* Jan - June 2011								

Are all feeders sized above the historical maximum dosage rate? Yes √ No

Are the feeders used compatible with chemicals used? Yes √ No

TREATMENT

Are the feeders used in good condition?	**Yes**	√	**No**	
Do all feeders have adjustable feed rates?	**Yes**	√	**No**	
Are the feed rate adjustments made manually or automatic? *Both options are used based on operating conditions.*	**Manual**	√	**Automatic**	√

How often are chemical feeders calibrated/checked for accuracy? *6 months*

How are quantities of chemicals fed determined (weighed by scales, calculated, etc.)? *Scales/volumetric measurements*

Does the system have duality for each of the feed systems?	**Yes**	√	**No**	
If the system does not have duality for each, are adequate spares available?	**Yes**	√	**No**	

List the storage used for each chemical

Chemical	Storage container type	Where Stored	Normal Quantity Stored
Polymer	*10,000 gal Bulk Tank*	*Chemical Bldg.*	*6,000 gal*
Ferric Sulfate	*10,000 gal. Bulk Tank*	*Chemical Bldg.*	*6,000 gal.*
Chlorine	*Ton Cylinders*	*Chlorine Room*	*22,000 lbs.*
Sulfuric Acid	*10,000 gal. Bulk Tank*	*Old Chemical Bldg.*	*5,000 gal.*
PAC	*Bulk & Bags/Pallets*	*Old Chem. & Bulk Tank*	*?????? lbs.*
Hydro Acid Fluoride	*5,000 gal. Bulk Tank*	*Chemical Bldg.*	*2,500 gal.*
Caustic (NaOH)	*2 -10,000 gal. Bulk Tanks 1 @ 25% & 1 @ 50%*	*Chemical Bldg.*	*5,000 gal.*
Zinc Orthophosphate	*5,000 gal. Bulk Tank*	*Chemical Bldg.*	*2,500 gal.*
Potassium Permanganate	*35 gal. Metal Drums*	*Old Chemical Bldg.*	*1,000 lbs.*

If bulk tanks are used, are day-use tanks provided?	**Yes**	√	**No**	
Are all chemical storage areas adequately labeled/marked?	**Yes**	√	**No**	
Does the system have backflow prevention on each of the feed units?	**Yes**	√	**No**	
Is adequate ventilation provided in all chemical feed/storage areas?	**Yes**		**No**	

CHLORINE GAS SAFETY

Does the system have a properly functioning chlorine leak detector?	**Yes**	√	**No**	

TREATMENT

CHLORINE GAS SAFETY (Continued)

If equipped with a detector, is it linked to both an audible and a visual alarm?	**Yes**	√	**No**	
Is proper self-contained breathing apparatus (SCBA) available?	**Yes**	√	**No**	
If so, is the SCBA properly maintained/fully charged?	**Yes**	√	**No**	
Is ammonium hydroxide available for leak location?	**Yes**	√	**No**	
Are the chlorine storage and feed rooms air-tight?	**Yes**	√	**No**	
Do the chlorine areas have exits to the outside equipped with panic bars?	**Yes**	√	**No**	
Are the inactive cylinders contained in a separate room from the feed area? *Empty cylinders are stored outside. Full cylinders are stored in chlorine feed room.*	**Yes**		**No**	√
Do the chlorine areas have a viewing/inspection window?	**Yes**	√	**No**	
Are all cylinders stored in a secured and upright position? *Ton cylinders are designed to be stored horizontally and are properly stored.*	**Yes**		**No**	√
Does the system have functional scales for weighing the chlorine cylinders?	**Yes**	√	**No**	
Are the cylinders stored in an area protected from excessive heat/direct sunlight?	**Yes**	√	**No**	
Is the chlorinator/feed area heated to at least 60^{oF}?	**Yes**	√	**No**	
Are the areas properly ventilated with a discharge located near the floor and an inlet near the ceiling?	**Yes**	√	**No**	
Does the ventilation fan provide for one complete air change per minute? *Chlorine scrubbers are installed for protection in the event of a leak.*	**Yes**		**No**	√
Are the controls for the fan located on the outside of the room? *Fan is door activated.*	**Yes**	√	**No**	
Are the chlorinators properly vented and screened?	**Yes**	√	**No**	

COAGULATION / FLOCCULATION

Number of Coagulation / Flocculation units *8*

TREATMENT

Type of Coagulation / Flocculation units *Philadelphia mixers/flocculators*

Total Volume of Coagulation / Flocculation units *1.88 Mgal. (includes sedimentation basins)*

How often are the Coagulation / Flocculation units cleaned? *Continuously (every 2 hr. batch cycle)*

Do the Coagulation / Flocculation units have mechanical mixing?	Yes	√	No	

Is the mixing rate adjustable in the units?	Yes	√	No	

How often is maintenance performed on mechanical units? *Oil is changed twice per year; all other maintenance is on an as needed basis.*

Do the Coagulation / Flocculation units appear visually adequate?	Yes	√	No	

SEDIMENTATION / CLARIFICATION

Number of Sedimentation / Clarification units *2 basins, 20 plate settler packs*

Type of Sedimentation / Clarifications units *Parkson plate settlers*

Total Volume of Sedimentation / Clarification units *1.88 Mgal. (includes coagulation/flocculation basins)*

How often are the Sedimentation / Clarification units cleaned? *Continuously*

How is sludge removed and disposed? *Claritrac – Pipe pulled along bottom of basin, siphons sludge to sludge lagoon*

Any sludge visible in the units?	Yes		No	√

Do the Sedimentation / Clarification units appear visually adequate?	Yes	√	No	

Settled Turbidity during survey *0.64 (N) & 0.62 (S) NTU* **Raw Turbidity during survey** *21 NTU*

Finished Turbidity during survey *0.077 NTU*

See attachment C for 2009 and 2010 turbidity readings recorded as part of an Area Wide Optimization Program (AWOP).

FILTRATION

Number of Filtration units *12*

TREATMENT

Type of Filtration units *Sand and granular activated carbon*

Size of Filtration units *2 @ 456 ft.^{2}, 4 @ 342.5 ft.^{2}, 6 @ 352 ft.^{2}*

Media/thicknesses *2 @ 4" sand, 32" GAC; 4 @ 4" sand, 28" GAC; 6 @ 4" sand, 30" GAC*

Can system meet demand with largest unit out of service?	**Yes**	√	**No**	
Does the system have turbidimeters for each of the filter effluent lines?	**Yes**	√	**No**	

Type of Backwash equipment *Surface scour spray arms*

Describe the criteria used to determine the need for backwash *See Attachment D1 for backwash set points.*

1) Hours, primary consideration, schedule with availability of stored backwash water.

2) Turbidity, plant effluent goal is less than 0.1 NTU,

3) Percentage the effluent valve is open.

What is the average backwash frequency? *48 hours*

Describe the backwash procedure (including return to service) *See Attachment D2 for backwash procedure.*

See ATTACHMENT *D3* **graph/ details of backwash study performed by the system.**

A filter study is performed on one filter each week.

Does the backwash procedure appear to be adequate?	**Yes**	√	**No**	
Are floor drains present?	**Yes**	√	**No**	
Is the piping gallery color-coded?	**Yes**	√	**No**	
Is backwash water recycled?	**Yes**		**No**	√

Calculated Filter Rate *1.97 gpm/ ft.^{2}*

Is Filter Rate in an acceptable range?	**Yes**	√	**No**	

TREATMENT

Calculated Backwash Rate *12 gpm/ft.^{2} minimum; 16 gpm/ft^2 maximum*

Based on 5500 gpm target backwash rate.

Is Backwash Rate in an acceptable range?	**Yes**	√	**No**	

Filter media visually appears worn and needs replaced? *One third of the filter media is replaced or regenerated (GAC) each year. Filters 11 – 15 replaced in 2011.*	**Yes**		**No**	√

Log removal/inactivation for *Giardia*?
Note The system has a large baffled clearwell. At design capacity (20 MGD) the free chlorine must be 0.35 ppm or greater to achieve 3-log removal

See attachment E

See ATTACHMENT S *E* **for log removal/inactivation for *Giardia*.**

CLEARWELL

What is the clearwell volume? *1.5 Mgal.*

Is the clearwell protected from contamination?	**Yes**	√	**No**	

Is the clearwell baffled?	**Yes**	√	**No**	

DISTRIBUTION SYSTEM

Does the system have accurate and up-to-date distribution mapping?	**Yes**	√	**No**	
Does the mapping show all line, valve, and hydrant locations?	**Yes**	√	**No**	
Does the mapping show pipe sizes and materials?	**Yes**	√	**No**	
Does the system maintain a distribution maintenance record? *A new computerized maintenance system is being developed that will include updated distribution mapping. Target completion date 12/2011.*	**Yes**	√	**No**	
Does the system maintain a customer complaint record?	**Yes**	√	**No**	

Minimum pressure in the system *30 psig*

Maximum pressure in the system *325 psig*

Piping materials/sizes used *715 miles of piping ranging from 11/2" to 30". See Attachment E for a detailed listing of distribution piping from 2010 PSC Annual Report.*

Does the system flush mains regularly?	**Yes**		**No**	√	**How often?**	*As needed*
Does the system exercise valves regularly?	**Yes**	√	**No**		**How often?**	*Valves > or = 16" 1/yr. Valves <16" 1/5 yr.*

Does the system disinfect all new lines?	**Yes**	√	**No**	
Does the system disinfect all repaired lines?	**Yes**	√	**No**	
Does the system perform bacteriological testing for all new lines?	**Yes**	√	**No**	
Does the system perform bacteriological testing for all repaired lines	**Yes**	√	**No**	
Does the system maintain adequate repair materials on-hand?	**Yes**	√	**No**	
Does the system have a formal Cross-Connection Control Program? *See attachment G for status report and typical correspondences.*	**Yes**	√	**No**	
Has the system made inspections for cross-connections?	**Yes**	√	**No**	
Has the system installed or had installed any backflow prevention assemblies?	**Yes**	√	**No**	

DISTRIBUTION SYSTEM

Are all customers metered (including facilities such as fire stations)?	Yes	√	No	

What is the latest reported/calculated water loss? *23.4 % for all of WVAWC per the 2010 WVPSC Annual Report*
Huntington facility estimates 23%

SERVICE CONNECTION SUMMARY

	Connection Type			
	Residential	**Commercial**	**Industrial**	**Public**
Number of connections	*51188*	*2793*	*51*	*264*
Meter Size	*5/8" to 2"*	*5/8" to 6"*	*5/8" to 6"*	*5/8" to 6"*

Totals include both Huntington and Salt Rock Districts as reported in the December 2010PSC Annual Report.

Population served *119780*

Any Purchase Systems?	Yes	√	No		List them

Lavalette PSD 7,840 (from 2010 PSD Report) and Ohio-American Water Company 9,500 (from water company) population served

Does the system purchase from another?	Yes		No	√	List

Total Population served (with all purchase systems) *137,120*

FINISHED WATER STORAGE

The following tanks were inspected during the Sanitary Survey; see Attachment H for a complete list of the system's storage tanks and booster stations.

Name of Storage unit/facility *Greenbottom Tank*

Type: Ground [√] Elevated [ ] Below ground [ ]

Construction material *Steel* **Date of construction** *1981*

Date of last painting *1981* **Date of last cleaning** *2005*

Dimensions *40 ft. H x 36 ft. Dia.* **Total volume** *300,000 gallons*

Base elevation *794 ft.* **Top elevation** *837 ft. estimated* **Overflow elevation** *834 ft.*

Control type *Telemetry*

High water setting *38 ft.* **Volume** *289,200 gallons*

Low water setting *15 ft.* **Volume** *114,200 gallons*

Properly functioning visual level gauge? Yes [ ] No [√]

Sampling tap? Yes [√] No [ ]

Exterior condition: Good [√] Fair [ ] Poor [ ]

Oxidized paint and some surface minor rust present.

Interior condition: Unknown [√] Good [ ] Fair [ ] Poor [ ]

Adequately fenced Yes [√] No [ ] **Adequately vented** Yes [√] No [ ]

Adequate overflow Yes [√] No [ ] **Proper access ladder** Yes [ ] No [√]

Ladder have been cut off approximately 20 ft. above ground for security purposes.

Tank lid/manhole secured/locked? Yes [√] No [ ]

Valve vault secured/locked? Yes [√] No [ ]

Good site drainage? Yes [ ] No [ ]

FINISHED WATER STORAGE

Name of Storage unit/facility *Lavalette Tank*

Type: Ground [ ] Elevated [√] Below ground [ ]

Construction material *Steel* **Date of construction** *1995*

Date of last painting *1995* **Date of last cleaning** *1995*

Dimensions *150.5 ft. H x 43 ft. Dia.* **Total volume** *250,000 gallons*

Base elevation *880 ft.* **Top elevation** *1035 ft.est.* **Overflow elevation** *1030.5 ft.*

Control type *Telemetry*

High water setting *32 ft.(in bowl)* **Volume** *230,000 gallons (estimated)*

Low water setting *19 ft. (in bowl)* **Volume** *190,000 gallons (estimated)*

Properly functioning visual level gauge? Yes [ ] No [√]

Sampling tap? Yes [ ] No [√]

Exterior condition: Good [ ] Fair [√] Poor [ ]
Large surface rust areas c
legs and supply line

Interior condition: Unknown [√] Good [ ] Fair [ ] Poor [ ]

Adequately fenced Yes [√] No [ ]
One corner support for barbed wire broken.

Adequately vented Yes [√] No [ ]

Adequate overflow Yes [ ] No [√]

Proper access ladder Yes [ ] No [√]

Overflow piping and ladder have been cut off approximately 20 ft. above ground for security purposes.
Overflow causing erosion at tank foundation see photos in attachment I.

Tank lid/manhole secured/locked? Yes [√] No [ ]

Valve vault secured/locked? *N/A* Yes [ ] No [ ]

Good site drainage? Yes [√] No [ ]

FINISHED WATER STORAGE

Name of Storage unit/facility	*Target Tank*

Type: Ground [√] Elevated [ ] Below ground [ ]

Construction material *Steel* **Date of construction** *2004*

Date of last painting *2004* **Date of last cleaning** *2004*

Dimensions *43 ft. H x 34ft. Dia.* **Total volume** *440,000 gallons*

Base elevation *??? ft.* **Top elevation** *??? ft. (estimated)* **Overflow elevation** *??? ft.*

Control type *Telemetry*

High water setting *31 ft (est.).* **Volume** *401,200 gallons*

Low water setting *25.5 ft (est.).* **Volume** *330,000 gallons*

Properly functioning visual level gauge?	**Yes**		**No**	√
Sampling tap?	**Yes**	√	**No**	
Exterior condition:	**Good**	√	**Fair**		**Poor**	
Interior condition:	**Unknown**	√	**Good**		**Fair**		**Poor**	
Adequately fenced	**Yes**	√	**No**		**Adequately vented**	**Yes**	√	**No**	
Adequate overflow	**Yes**	√	**No**		**Proper access ladder**	**Yes**		**No**	√

Ladder have been cut off approximately 20 ft. above ground for security purposes.

Tank lid/manhole secured/locked?	**Yes**	√	**No**	
Valve vault secured/locked?	**Yes**	√	**No**	
Good site drainage?	**Yes**	√	**No**	

PUMPS / PUMP FACILITIES AND CONTROLS

See Attachment H for all booster pump data and Attachment 1 for a complete list of all pump motors. The following booster stations are those inspected during this survey.

Pump Name / Use *Ridder Hill Booster Station (2-40 Hp, Peerless)*

Displacement Pump:	**Reciprocating**		**Rotary**		**Other**		
Centrifugal Pump:	**Vertical Turbine**	√	**Submersible**		**Other**		

Pump Capacity *350 gpm each*

P&M schedule?	**Yes**	√	**No**		**Properly working?**	**Yes**	√	**No**
Spare available/Duality?	**Yes**	√	**No**					

Is pump at a booster station (location other than: treatment area, well, or intake)?						**Yes**	√	**No**		
Is booster station subject to flooding?	**N/A**		**Yes**		**No**	√				
Is station properly designed/maintained (floor drains, security)?	**N/A**		**Yes**	√	**No**					

Pump Name / Use *Edgewood Booster Station (2-75 HP, Flowways)*

Displacement Pump:	**Reciprocating**		**Rotary**		**Other**		
Centrifugal Pump:	**Vertical Turbine**	√	**Submersible**		**Other**		

Pump Capacity *250 gpm each*

P&M schedule?	**Yes**	√	**No**		**Properly working?**	**Yes**	√	**No**
Spare available/Duality?	**Yes**	√	**No**					

Is pump at a booster station (location other than: treatment area, well, or intake)?						**Yes**	√	**No**		
Is booster station subject to flooding?	**N/A**		**Yes**		**No**	√				
Is station properly designed/maintained (floor drains, security)?	**N/A**		**Yes**	√	**No**					

PUMPS / PUMP FACILITIES AND CONTROLS

Pump Name / Use *Edgewood Booster (2- 5 Hp, Grundfos)*

Displacement Pump:	**Reciprocating**		**Rotary**		**Other**		
Centrifugal Pump:	**Vertical Turbine**	√	**Submersible**		**Other**		

Pump Capacity *75 gpm each*

P&M schedule?	**Yes**	√	**No**		**Properly working?**	**Yes**	√	**No**
Spare available/Duality?	**Yes**	√	**No**					
Is pump at a booster station (location other than: treatment area, well, or intake)?					**Yes**	√	**No**	
Is booster station subject to flooding?	**N/A**		**Yes**		**No**	√		
Is station properly designed/maintained (floor drains, security)?	**N/A**		**Yes**	√	**No**			

Pump Name / Use *Briarcliffe #2 Booster Station (2-3 Hp Grundfos)*

Displacement Pump:	**Reciprocating**		**Rotary**		**Other**		
Centrifugal Pump:	**Vertical Turbine**		**Submersible**		**Other**		

Pump Capacity *50 gpm*

P&M schedule?	**Yes**	√	**No**		**Properly working?**	**Yes**	√	**No**
Spare available/Duality?	**Yes**	√	**No**					
Is pump at a booster station (location other than: treatment area, well, or intake)?					**Yes**	√	**No**	
Is booster station subject to flooding?	**N/A**		**Yes**		**No**	√		
Is station properly designed/maintained (floor drains, security)?	**N/A**		**Yes**	√	**No**			

PUMPS / PUMP FACILITIES AND CONTROLS

Pump Name / Use	*Garden Farm Booster (2-25 HP, Grundfos)*

Displacement Pump:	**Reciprocating**		**Rotary**		**Other**		
Centrifugal Pump:	**Vertical Turbine**	√	**Submersible**		**Other**		

Pump Capacity *400 gpm*

P&M schedule?	**Yes**	√	**No**		**Properly working?**	**Yes**	√	**No**
Spare available/Duality?	**Yes**	√	**No**					
Is pump at a booster station (location other than: treatment area, well, or intake)?					**Yes**	√	**No**	

Is booster station subject to flooding?	**N/A**		**Yes**		**No**	√		
Is station properly designed/maintained (floor drains, security)?	**N/A**		**Yes**	√	**No**			

MONITORING / REPORTING/ DATA VERIFICATION

Any current violations?	**Yes**		**No**	√

If so, list violations *N/A*

Have all required sampling plans been submitted?	**Yes**	√	**No**	
Have all Monthly Operational Reports (MOR's) been completed/submitted?	**Yes**	√	**No**	
Have the MOR's been completed properly?	**Yes**	√	**No**	
Have all Phase II/V tests been conducted/submitted?	**Yes**	√	**No**	
Have the Phase II/V tests been conducted properly?	**Yes**	√	**No**	
Have all bacteriological tests been conducted/submitted?	**Yes**	√	**No**	
Have the bacteriological tests been conducted properly?	**Yes**	√	**No**	
Have all Lead and Copper tests been conducted/submitted?	**Yes**	√	**No**	
Have the Lead and Copper tests been conducted properly?	**Yes**	√	**No**	

System conducting all DBPR testing?	**Yes**	√	**No**		**NA**	
Have all Public Notices been conducted as required?	**Yes**		**No**		**NA**	√

Does the system have proper monitoring equipment?	**Yes**	√	**No**	
Is monitoring equipment properly calibrated?	**Yes**	√	**No**	
Have any Boil Water Orders been issued since the last sanitary survey?	**Yes**	√	**No**	

If so, list reasons *All BWN were issued by the system in response to line breakages and routine maintenance* activities.

WATER SYSTEM MANAGEMENT / OPERATION

Are the administrative files up-to-date?	**Yes**	√	**No**	
Are files maintained for correct time frames?	**Yes**	√	**No**	
Do files contain all required items?	**Yes**	√	**No**	

SYSTEM EMPLOYEES / PERSONNEL

Employee / Personnel Name	Title
Ex. 4 - CBI	*Production Supervisor*
	Water Quality Supervisor
	Production Supervisor
	Maintenance Specialist
	Distribution Maintenance Technicians

Is personnel adequate to maintain the system?	**Yes**	√	**No**	

Describe the planning / purchasing process: *West Virginia American currently uses a CPS (Comprehensive Planning Survey) as a planning tool. Five year cash forecasts are prepared for operational expenditures and for capital construction projects; these plans are reviewed and updated annually. A purchase order system is used for all major expenditures. A new computerized planning system is being developed and is expected to be on line by the end of 2011.*

Does system have O&M manuals?	**Yes**	√	**No**	
Does system have a SOP?	**Yes**	√	**No**	
Is system self-supporting?	**Yes**	√	**No**	

Income / Revenue for previous year *Operating Revenue-$123,018,576 per 2010 PSC Annual Report*

Expenses for previous year *$113,092,319 Net Income- $9,926,257*

These figures for revenue and expenditures were taken from the 12/31/2010 WVPSC Annual Report. They represent the income statement totals for all of the WVAWC system; not for just the Huntington District.

OPERATOR COMPLIANCE WITH STATE REQUIREMENTS

LIST OF OPERATORS

Operator Name	Title	Certification Level / Number	Expiration Date
Ex. 4 - CBI	*Production Supervisor*	*Class 4, 20683*	*12/31/2012*
	Water Quality Supervisor	*Class 4, 21135*	*12/21/2013*
	Production Supervisor	*Class 4, 19346*	*03/31-2012*
	Maintenance Mechanic	*Class 4, 20668*	*12/31/2012*
	Operator	*Class 4, 20633*	*1/31/2013*
	Operator	*Class 4, 21753*	*07/31/2013*
	Operator	*Class 4, 19379*	*04/05/2012*
	Operator	*Class 4, 20377*	*10/31/2012*
	Operator	*Class 2, 21637*	*05/13/2013*
	Operator	*Class OIT, 20399*	*10/31/2012*
	Operator	*Class WD, 21458*	*05/31/2013*
	Operator	*Class DW, 20598*	*12/31/2012*
	Distribution	*Class , 21596*	*5/31/2013*
	Distribution	*Class 4, 18645*	*11/30/2011*
	Distribution	*Class 3, 20765*	*12/31/2012*
	Distribution	*Class 4, 17166*	*12/31/2011*
		Class WD, 21539	*05/31/2013*
		Class WD, 21507	*06/30/2013*
	Distribution	*Class WD,OIT, 19724*	*04/12/2012*
	Distribution	*Class 2, 21640*	*05/31/2013*
		Class OIT, 21241	*04/30/2013*

Is number of operators sufficient to operate / maintain system?	**Yes**	√	**No**	
Do operators have proper knowledge to operate / maintain system?	**Yes**	√	**No**	

	2011 Monthly Total M Gal	2011 Daily Max M Gal	2011 Daily Average M Gal	2010 total Gal	M 2010 daily max Gal	M 2010 Daily Average GL	M 2009 Total Gal	M 2009 Daily Max Gal	M 2009 Daily Average M Gal
January	369,757	12,809	11,928	371,003	13,314	11,968	350,697	15,073	11,313
February	322,911	11,997	11,533	335,618	12,656	11,986	299,532	12,677	10,698
March	361,470	12,218	11,660	349,538	12,680	11,275	309,521	11,581	9,985
April	353,573	12,743	11,786	335,718	12,160	11,191	295,965	11,215	9,866
May	357,790	12,743	11,542	353,102	13,012	11,390	323,858	11,723	10,447
June	362,672	13,536	12,089	345,572	13,527	11,519	352,019	14,384	11,734
July				390,696	13,460	12,603	357,337	13,177	11,527
August				359,900	14,436	11,610	378,091	13,190	12,196
September				374,764	13,226	12,492	348,787	12,949	11,626
October				300,968	12,948	9,709	346,903	11,714	11,190
November				350,323	12,466	11,677	338,969	12,389	11,299
December				363,988	12,592	11,742	341,264	13,098	11,009
Total				4,231,190			4,042,943		
Averages	354,696	12,674	11,756	352,599	13,040	11,597	336,912	12,764	11,074

	Year		
	2009	**2010**	**2011***
Daily Watr Treated (MGD)	11074	11597	11756
Daily Pumping Time (hours)	24	24	24

* Jan - June 2011

	List of average treatment levels per chemical							
	AS 2820 Polymer mg/l	H2SO4 mg/l	NaOH mg/l	NFS mg/l	Zinc Phosphate mg/l	Filter Aid mg/l	Pre Chlorine mg/l	Post Chlorine mg/l
2009 Average	28.7	5.3	16.7	4.2	2.8	0.2	2.1	2.9
2010 Average	24.8	4.2	13.9	4.0	2.6	0.4	2.6	3.3
2011 Average*	23.2	1.0	25.8	4.6	2.6	0.6	2.6	3.5
* Jan - June 2011								

Jan-09	31	0	12	4	3	0.1	2	3
Feb-09	35	0	13	4.4	2.8	0	2	2.8
Mar-09	35	0	11	4.3	2.8	0	1.8	2.5
Apr-09	31	0	12	4	2.9	0	2	2
May-09	28	0	14	4.4	3	0.1	1.7	2.4
Jun-09	33	0	17	3.8	2.7	0.1	2	2
Jul-09	30	18	21	4.7	2.7	0	2.1	2.9
Aug-09	32	16	22	4.4	2.5	0	2.3	3.3
Sep-09	24	3	15	4.6	2.6	0.1	2.6	3.6
Oct-09	20	9	13	3.6	2.7	0.2	2.4	3.6
Nov-09	19	13	20	4.1	2.7	1.6	2.4	3.3
Dec-09	26	4	30	4.1	2.7	0.7	2.3	3
Jan-10	23	1	1	4	3	0.1	2	3
Feb-10	20	0	16	4	2.6	0.1	2.3	3
Mar-10	21	1	15	3.9	2.6	0.2	2.5	3.1
Apr-10	18	7	14	4	2.7	0.27	2	3
May-10	30	1	16	3.9	2.6	0.3	2.6	3.4
Jun-10	27	0.5	14	3.7	2.7	0.3	2.8	3.6
Jul-10	26	9	15	3.5	2.5	0.4	3	3.7
Aug-10	25	6	15	3.8	2.7	0.6	3.1	3.7
Sep-10	26	9	14	4	2.7	0.5	2.8	3.5
Oct-10	24	8	13	4.4	2.7	0.5	2.6	3.5
Nov-10	25	7	13	4	2.6	0.5	2.5	3.2
Dec-10	33	0.4	21	4.4	2.3	0.5	2.7	3.1
Jan-11	21	6	29	5	3	0.5	3	3
Feb-11	21	0	26	4.9	2.5	0.6	2.9	3.1
Mar-11	23	0	29	5.2	2.6	0.7	2.9	5.2
Apr-11	26	0	25	5	2.66	1	2	3
May-11	23	0	23	3.9	2.4	0.6	2	3.1
Jun-11	25	0	23	3.4	2.4	0.4	2.5	3.4
Jul-11								

WATER ANALYSIS REPORT
SAINT ALBANS DISTRICT LABORATORY

		PWSID #	*3300608*
WATER SUPPLY	*WVAWC-Huntington District*	COUNTY	*Cabell*
ADDRESS	*4002Ohio River Road*	DATE OF ANALYSIS	*8/22/2011*
	Huntington, WV 25701	DATE OF COLLECTION	*8/11/2011*
COLLECTED BY	*R. C. Snyder*	TIME OF COLLECTION	*2:30 p.m.*
☐ FINISHED WATER	☒ RAW WATER	POINT OF COLLECTION	*Plant raw water tap*

SECONDARY STANDARDS AND MISCELLANEOUS PARAMETERS

Lab - Analysis Date	HTN 8/11/2011	SADO – 8/22/2011
Alkalinity (PHTH) (as $CaCO_3$) (mg/l)	---	---
Alkalinity (M.O.) (as $CaCO_3$) (mg/l)	*75*	*71*
Calcium Hardness (as $CaCo_3$) (mg/l)	---	---
Total Hardness (as $CaCO_3$) (mg/l)	*147*	*140*
pH (std. units)	*7.39*	*7.7*
*Turbidity (0.5 NTU)	*8*	---
*Iron (0.3) (mg/l)	*0..170*	*0.05*
*Manganese (0.05) (mg/l)	*0.079*	*0.035*
TDS (mg/l)	---	---
Temperature (°C)	---	---
LSI (0 = ideal, <0 = corrosive, >0 = scaling)	---	---
Chlorine Residual (mg/l) ☐ free ☐ total	---	---
Other Fluoride (mg/l)	*0.18*	*0.28*

Remarks: *Iron not digested prior to testing.*

Analyst *R.C. Snyder*

*Maximum Desirable Concentrations Are Shown in Parenthesis.

SAINT ALBANS DISTRICT LABORATORY
808 AB@ STREET, SUITE G
ST. ALBANS, WV 25177
(304) 722-0611

Attachment J1
Raw Water Analysis
WVAWC -Huntington Sanitary Survey
August 11, 2011

WATER ANALYSIS REPORT
SAINT ALBANS DISTRICT LABORATORY

		PWSID #	*3300609*
WATER SUPPLY	*WVAWC-Huntington District*	COUNTY	*Cabell*
ADDRESS	*4002 Ohio River Road*	DATE OF ANALYSIS	*8/22/2011*
	Huntington, WV 25701	DATE OF COLLECTION	*8/11/2011*
COLLECTED BY	*R.C. Snyder*	TIME OF COLLECTION	*2:30 p.m..*
☒ FINISHED WATER	☐ RAW WATER	POINT OF COLLECTION	*Plant lab sink*

SECONDARY STANDARDS AND MISCELLANEOUS PARAMETERS

Lab - Analysis Date	HTN – 8/11/2011	SADO – 8/22/2011
Alkalinity (PHTH) (as $CaCO_3$) (mg/l)	---	*0*
Alkalinity (M.O.) (as $CaCO_3$) (mg/l)	*75*	*73*
Calcium Hardness (as $CaCo_3$) (mg/l)	---	---
Total Hardness (as $CaCO_3$) (mg/l)	*154*	*160*
pH (std. units)	*7.21*	*8.0*
*Turbidity (0.5 NTU)	*0.078*	---
*Iron (0.3) (mg/l)	*0.020*	*0.03*
*Manganese (0.05) (mg/l)	*0.019*	*0.030*
TDS (mg/l)	---	---
Temperature (°C)	---	---
LSI (0 = ideal, <0 = corrosive, >0 = scaling)	---	---
Chlorine Residual (mg/l) ☒ free ☐ total	*2.80*	*1.9**
Other Fluoride (mg/l)	*1.06*	*1.05*

Remarks: *Iron not digested prior to testing.*

Analyst *R.C. Snyder*

*Maximum Desirable Concentrations Are Shown in Parenthesis.
* Analyzed 8/12/2011

SAINT ALBANS DISTRICT LABORATORY
808 AB@ STREET, SUITE G
ST. ALBANS, WV 25177
(304) 722-0611

Attachment J2
Finished Water Analysis
WVAWC -Huntington Sanitary Survey
May 23, 2006

PLANT:			**WVAWC - Huntington**				
DATE:			8/??/2011				
PWSID#:			3300608				
	*	*	*	*	*		*
TREATMENT UNIT:	**UNIT 1 Rapid Mix**	**UNIT 2 Pre Sed**	**UNIT 3 Coag/Floc**	**UNIT 4 Sed**	**UNIT 5 Clearwell**	**UNIT 6 Storage**	**UNIT 7**
VOLUME, (GAL):	1	1	1,880,000	1	1,500,000	1	
PUMPING RATE,(GPM):	1	1	13,889	1	13,889	1	
TEMPERATURE,(C):			10.0		10.0		
pH:			7.00		7.00		
FREE CL RES, (MG/L):			1.00		0.35		
T10 / T:	0.50	0.50	0.50	0.50	0.50	1.00	0.00
T(MIN)=	1.00	1.00	135.36	1.00	108.00	1.00	0.00
T10 (MIN)=	0.50	0.50	67.68	0.50	54.00	1.00	0.00
CT (MG/L-M)=	0.00	0.00	67.68	0.00	18.90	0.00	0.00
e exponent=	2.46	2.46	4.58	2.46	4.50	2.46	0.00
e^x=	11.70	11.70	97.32	11.70	89.73	11.70	0.00
LOG INACTIVATION=	0.00	0.00	1.75	0.00	0.53	0.00	0.00

FILTER (ASSIGN VALUE) **2.50**

TOTAL LOG INACTIVATION = **4.78**

Log calc. For <12.5: $LOG = \frac{CT}{0.353 * \{12.006 + e^{(2.46 - 0.073*temp + 0.125*C + 0.389*pH)}\}}$

Log calc. For = or > 12.5: $LOG = \frac{CT}{0.361 * \{-2.261 + e^{(2.69 - 0.065*temp + 0.111*C + 0.361*pH)}\}}$

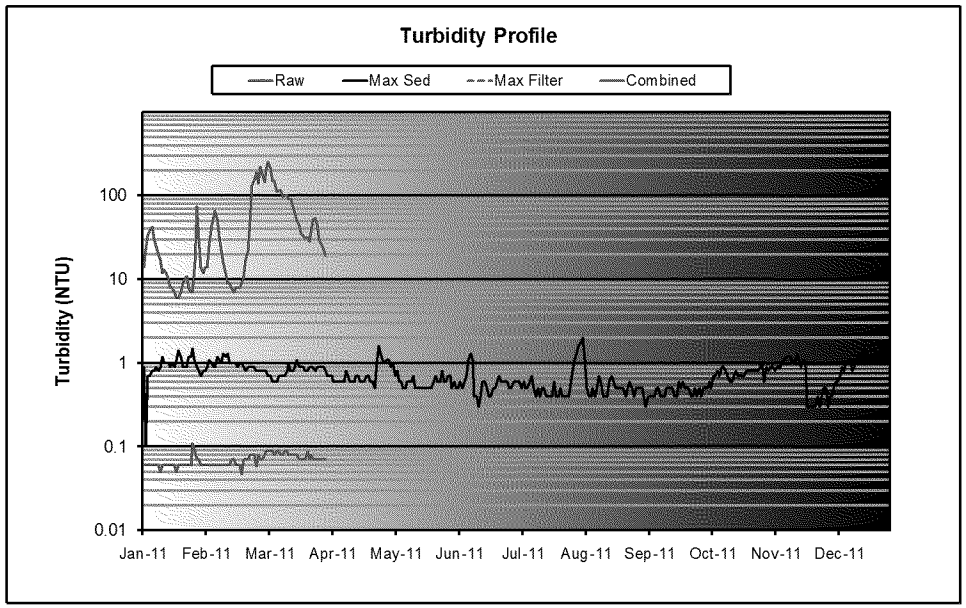
Notes:

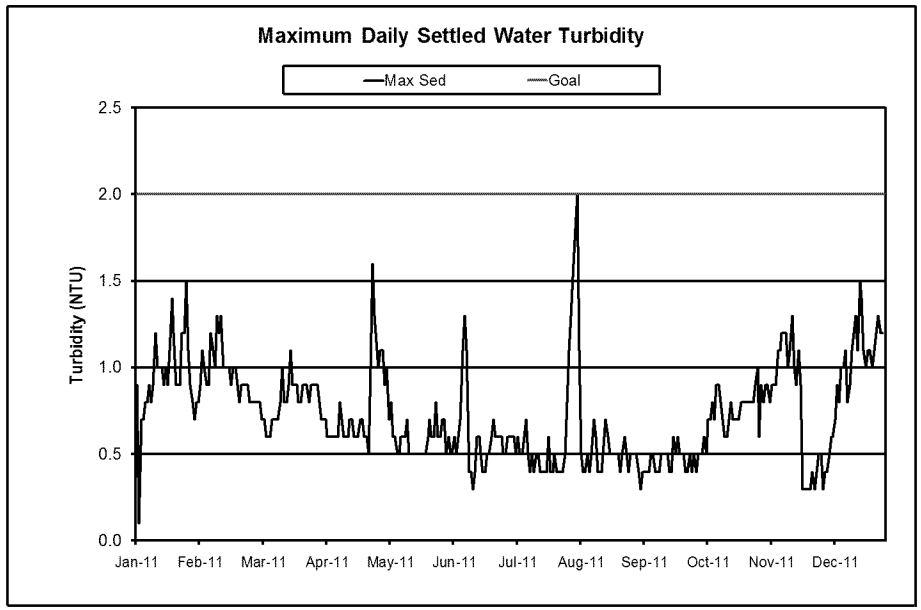
1 EPA and West Virginia standards require a minimum giardia cyst log inactivation of 3.0 (99.9% reduction), for surface water sources or for ground water under the direct influence (GUDI) of surface water.

2 The equation used in this program was provided by the USEPA.

3 This log inactivation calculation is based on actual conditions at the plant. The temperature, pH and free chlorine residual were measured during the site visit.

Attachment C
CT Calculations (Conditions at time of Survey)
WVAWC - Huntington Sanitary Survey
8/??/2011





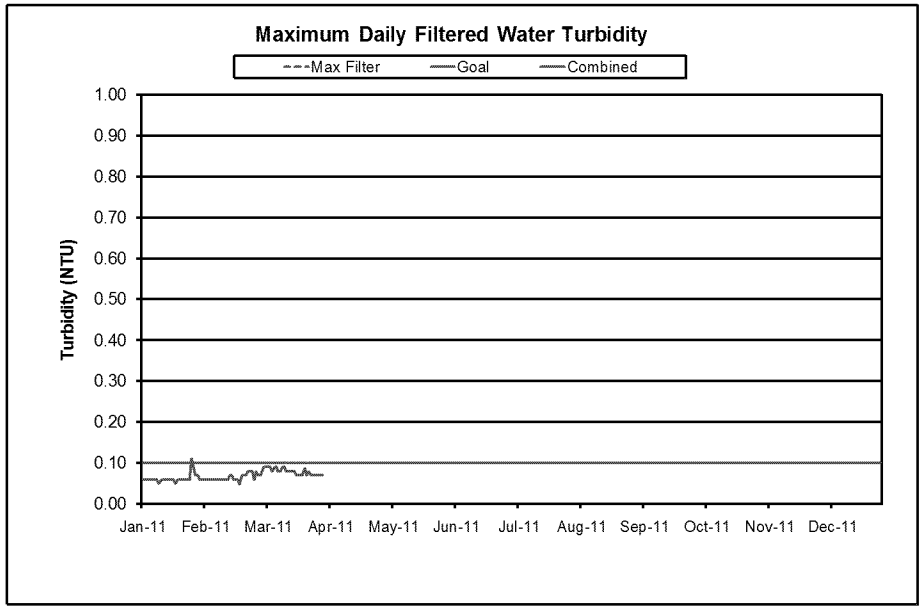
ANNUAL DATA	Avg	Min	Max	RSQ	95%	Opt. Goal	Reg.
	NTU	NTU	NTU		NTU	% Values	% Values
Raw Turbidity	52.1	6.0	255.0	n/a	186.9	n/a	n/a
Max. Settled Turbidity	0.7	0.1	2.0	0.19	1.2	100.0	n/a
Max. Filtered Turbidity						#N/A	n/a
Combined Filtered Turbidity	0.07	0.05	0.11	0.05	0.09	98.6	100.0

RSQ = Correlation Coefficient for two selected data sets

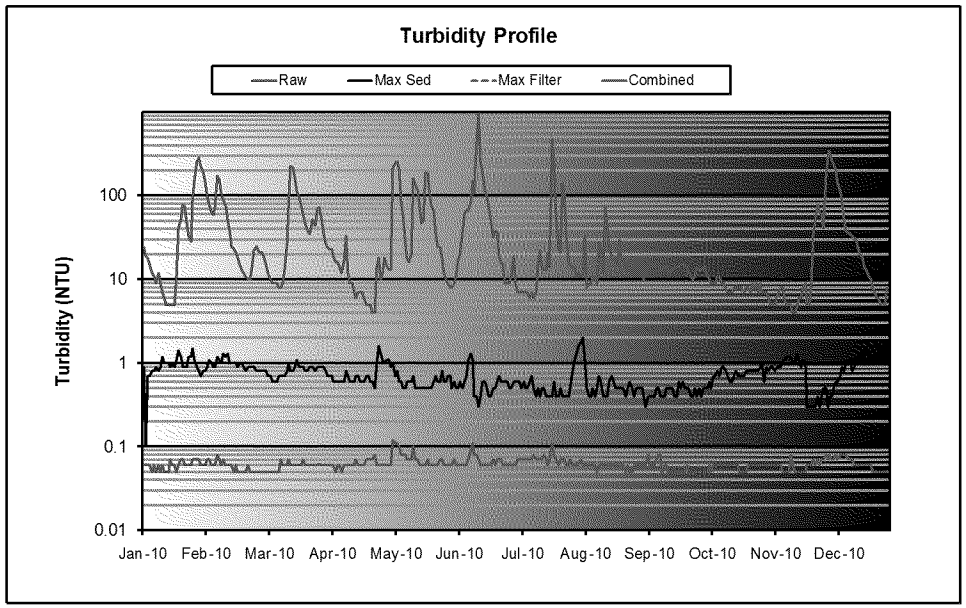
95% = 95th Percentile value for data set

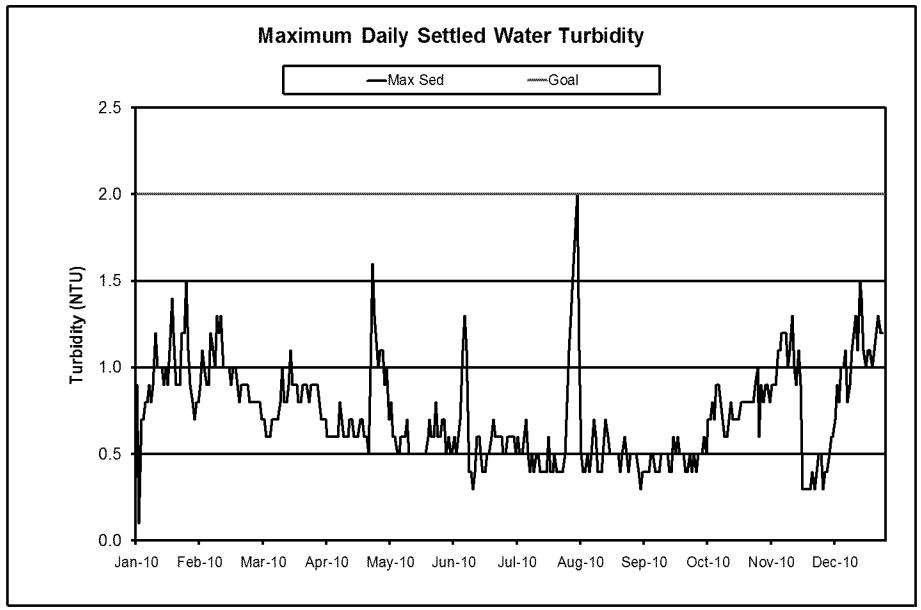
Opt. Goal = % of values in data set that are less than or equal to the selected optimization turbidity goal

Reg. = % of values in data set that are less than or equal to the regulated turbidity requirement



Attachment C1
AWOP Turbidity Charts
WVAWC - Huntington District Sanitary Survey
August 11, 2011





ANNUAL DATA	Avg	Min	Max	RSQ	95%	Opt. Goal	Reg.
	NTU	NTU	NTU		NTU	% Values	% Values
Raw Turbidity	44.3	4.0	956.0	n/a	202.6	n/a	n/a
Max. Settled Turbidity	0.7	0.1	2.0	0.01	1.2	100.0	n/a
Max. Filtered Turbidity						#N/A	n/a
Combined Filtered Turbidity	0.06	0.05	0.12	0.01	0.08	98.6	100.0

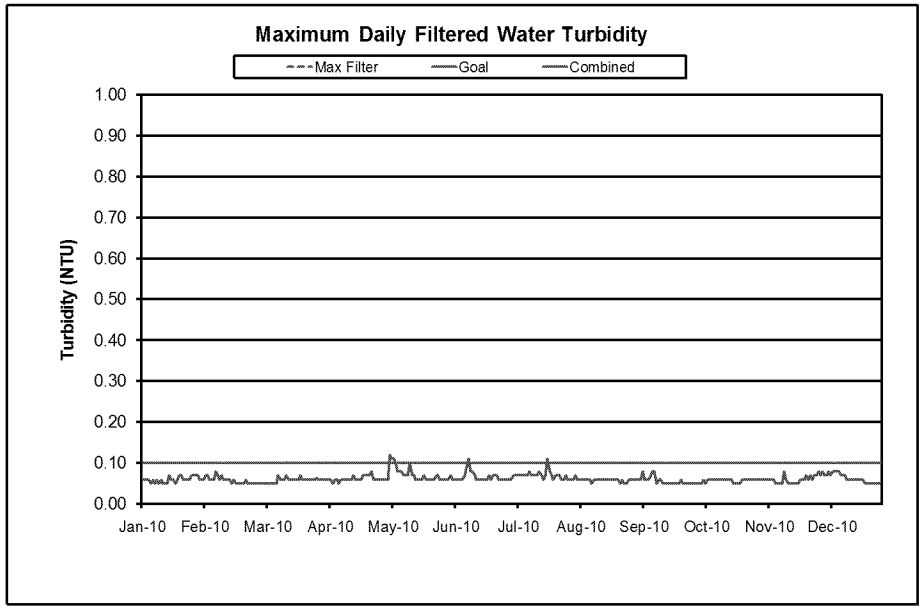
RSQ = Correlation Coefficient for two selected data sets

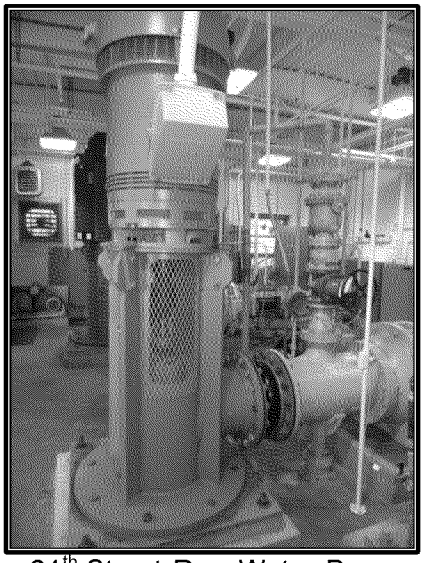
95% = 95th Percentile value for data set

Opt. Goal = % of values in data set that are less than or equal to the selected optimization turbidity goal

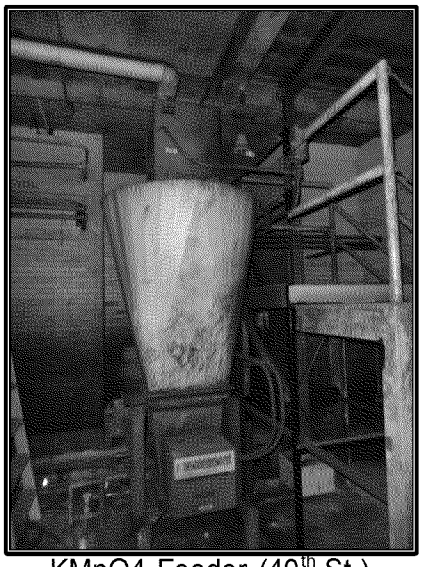
Reg. = % of values in data set that are less than or equal to the regulated turbidity requirement

Attachment C2
AWOP Turbidity Charts
WVAWC - Huntington District Sanitary Survey
August 11, 2011



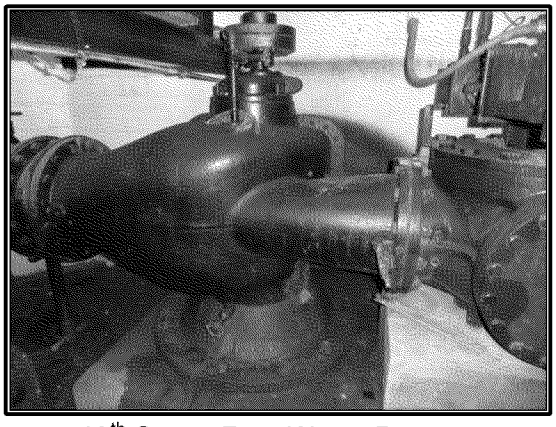


24th Street Raw Water Pump



KMnO4 Feeder (40th St.)

Sulfuric Acid Storage Tank



40th Street Raw Water Pump

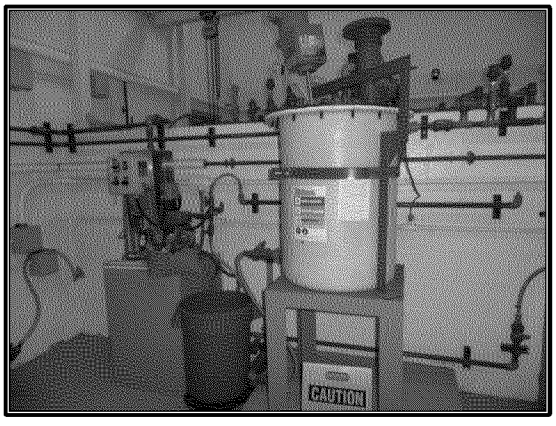
PAC Vent System

Rapid Mix Tank

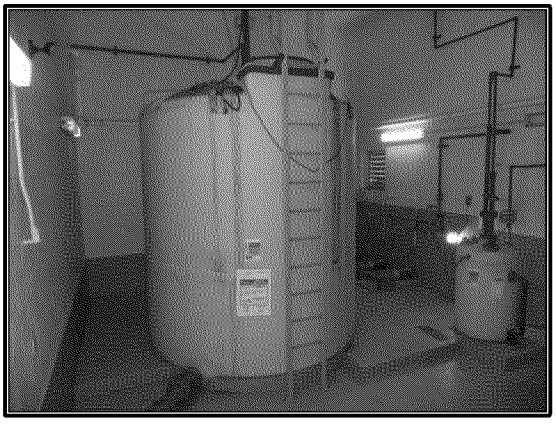
Attachment K1
Photos
WVAWC - Huntington District Sanitary Survey
August 11, 2011

Filter Wash Water Pumps

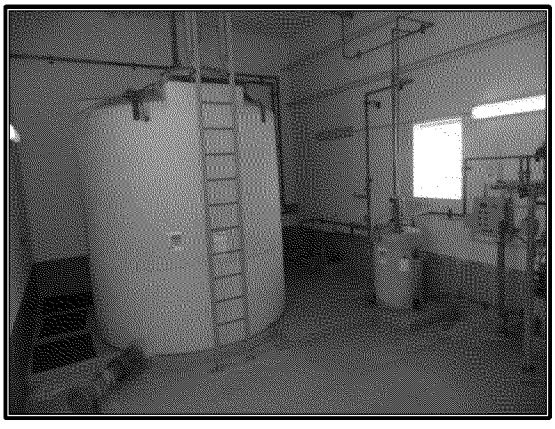
Polymer Feed System



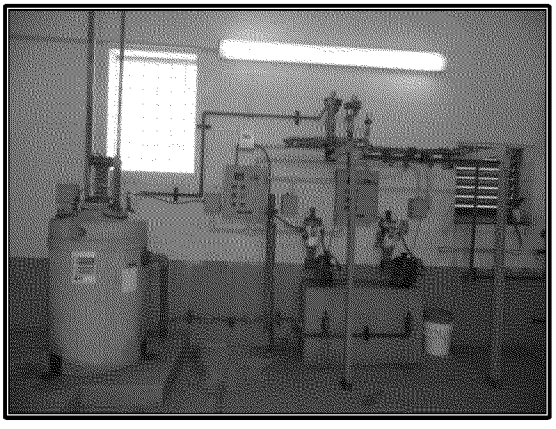
Thiosulfate Feed System



Zinc Phosphate Storage



Fluoride Bulk Tank

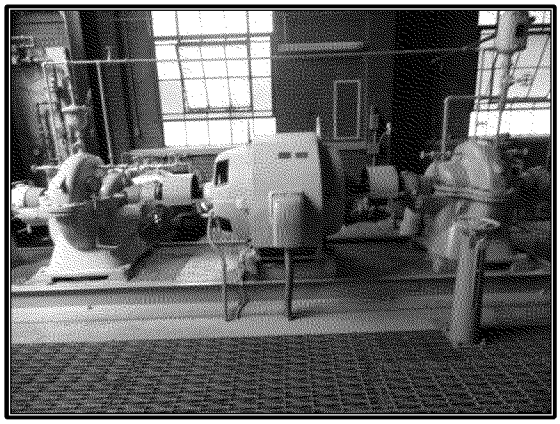


Fluoride Day Tank and Feed Controls

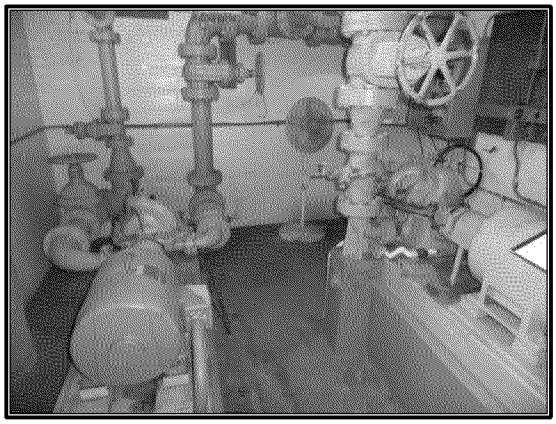
Attachment K2
Photos
WVAWC - Huntington District Sanitary Survey
August 11, 2011

Sludge Settling Pond

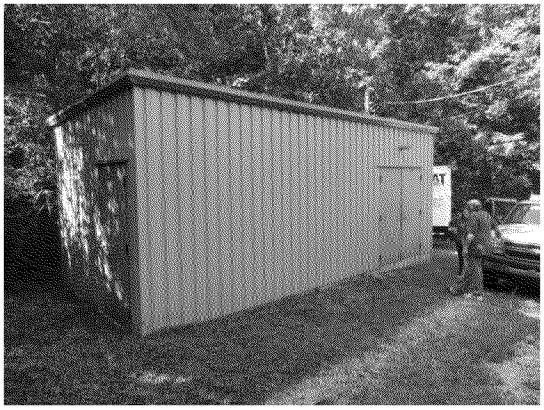
Drying Bed Material Removal



High Service Pump



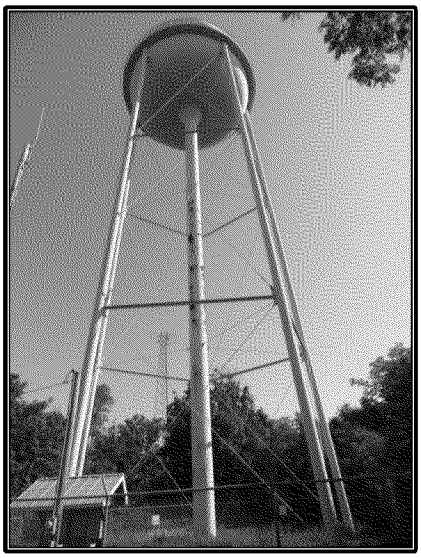
Ridge Hill Booster Station



Hill Road Booster Station

Hill Road Booster Pumps

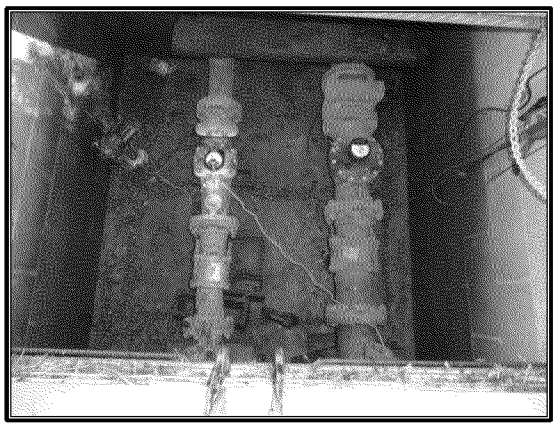
Attachment K3
Photos
WVAWC - Huntington District Sanitary Survey
August 11, 2011



Lavalette Tank

Lavalette Tank Overflow & Ladder

Erosion at Base of Lavalette Tank

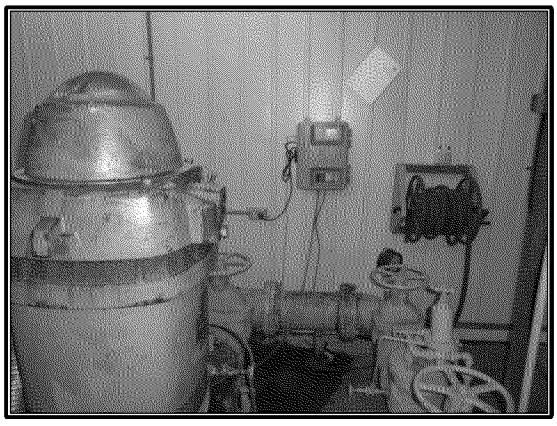


Lavalette Master Meter

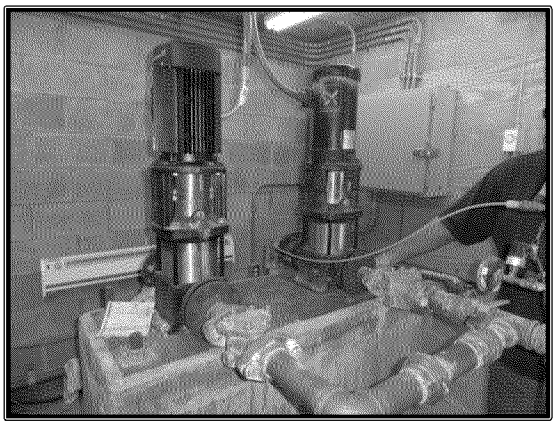
Portable Generator

Garden Farm Booster Pumps

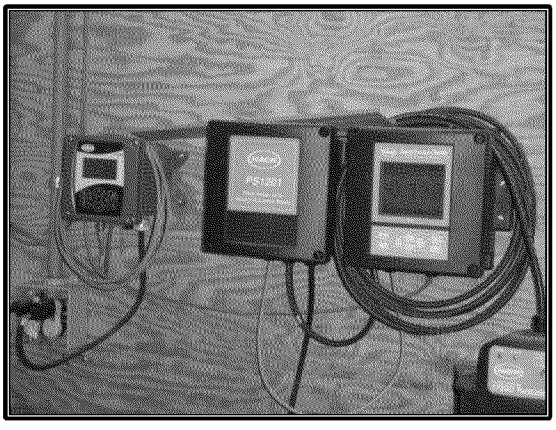
Attachment K5
Photos
WVAWC - Huntington District Sanitary Survey
August 11, 2011



Hill Road On-Line Chlorine Analyzer

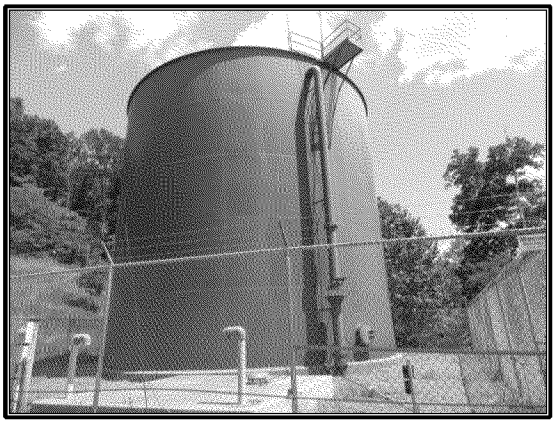


Edgewood Booster Pumps

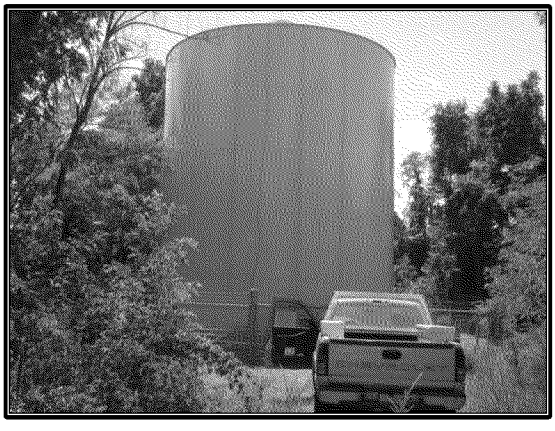


Edgewood On-Line Analyzers

Briarcliffe Booster Pumps

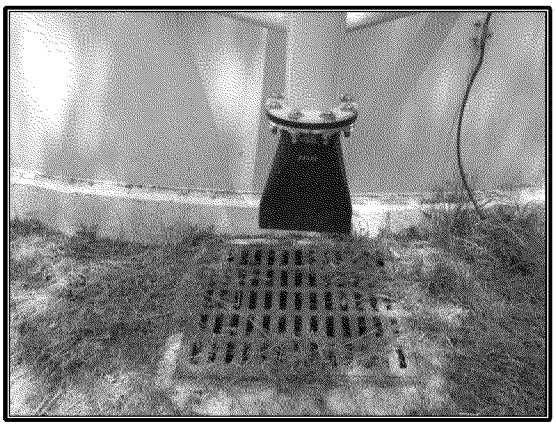


Target Tank

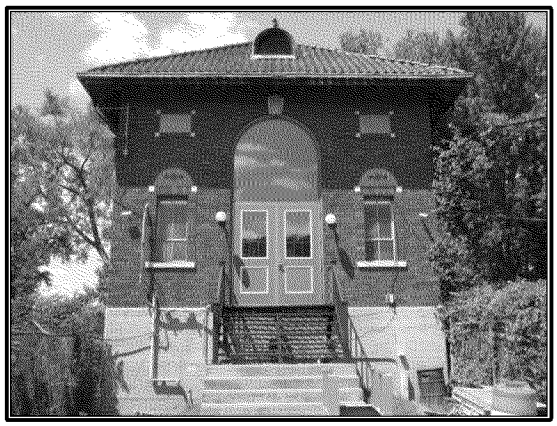


Greenbottom Tank

Attachment K4
Photos
WVAWC - Huntington District Sanitary Survey
August 11, 2011



Greenbottom Tank Overflow



40th Street Pump Intake House

40TH Street Pump Motor

Attachment K6
Photos
WVAWC - Huntington District Sanitary Survey
August 11, 2011